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(FILE 'HOME' ENTERED AT 08:28:21 ON 29 JAN 2002)

FILE 'CAPLUS, MEDLINE, BIOSIS, CA' ENTERED AT 08:28:34 ON 29 JAN 2002

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L1         27886 S SECOND (W) HARMONIC
L2         48472 S NONLINEAR (W) OPTICAL
L3        325014 S NUCLEIC (W) ACID
L4          9319 S L1 AND L2
L5             2 S L3 AND L4
L6       1159575 S ANTIBOD#
L7         14189 S L3 AND L6
L8             6 S L4 AND L6
L9             2 DUPLICATE REM L8 (4 DUPLICATES REMOVED)
L10         3211 S SUM (W) FREQUENCY
L11          692 S L10 AND L2
L12            2 S L3 AND L11
L13            0 S L 6 AND L11
L14       958407 S LIPID#
L15           11 S L4 AND L14
L16            6 DUPLICATE REMOVE L15 (5 DUPLICATES REMOVED)
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FILE 'STNGUIDE' ENTERED AT 08:41:20 ON 29 JAN 2002

L16 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2002 ACS
TI Molecular probes for **nonlinear optical** imaging of biological membranes
AB **Second-harmonic** generation (SHG) and two-photon excited fluorescence (TPEF) are **nonlinear optical** (NLO) phenomena that scale with excitation intensity squared, and hence give rise to an intrinsic 3-dimensional resoln. when used in microscopic imaging. TPEF microscopy has gained widespread popularity in the biol. community whereas SHG microscopy promises to be a powerful tool because of its sensitivity to local asymmetry. We have implemented an approach toward the design of NLO-probes specifically adapted for SHG and/or TPEF imaging of biol. membranes. Our strategy is based on the design of nanoscale amphiphilic NLO-phores. We have prepd. sym. bolaamphiphilic fluorophores combining very high two-photon absorption (TPA) cross-sections in the visible red region and affinity for cellular membranes. Their incorporation and orientation in **lipid** membranes can be monitored via TPEF anisotropy. We have also prepd. amphiphilic push-pull chromophores exhibiting both large TPA cross-sections and very large first hyperpolarizabilities in the near-IR region. These NLO-probes have proved to be particularly useful for imaging of biol. membranes by simultaneous SHG and TPEF microscopy and offer attractive prospects for real-time imaging of fundamental biol. processes such as adhesion, fusion or reporting of membrane potentials.
SO Proceedings of SPIE-The International Society for Optical Engineering (2001), 4461(Linear and Nonlinear Optics of Organic Materials), 20-32
CODEN: PSISDG; ISSN: 0277-786X
AU Blanchard-Desce, Mireille H.; Ventelon, Lionel; Charier, Sandrine; Moreaux, Laurent; Mertz, Jerome

L16 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
TI Optoelectronic materials derived from salmon deoxyribonucleic acid (DNA)
AB A new type of optoelectronic film material, DNA-**lipid** film was firstly prepd. from salmon DNA which was doped with **nonlinear optical** (NLO) org. dyes. UV-visible and fluorescent spectroscopic analyses for the dye-doped-DNA-**lipid** film materials suggested that the NLO dye mols. was intercalated in the DNA helixes accompanying self-organization and self-assembly of 3 combinations of dye mols., quaternized NH4+ cation and DNA anion on cast matrix surface. **Second harmonic** generation (SHG) measurement showed orientation of the dye intercalated in DNA-**lipid** complex film.
SO MCLC S&T, Sect. B: Nonlinear Opt. (2000), 24(1-2), 63-68
CODEN: MCLOEB; ISSN: 1058-7268
AU Wang, Lili; Zhang, Gongjian; Horinouchi, Suguru; Yoshida, Jonichi; Ogata, Naoya

L16 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
TI Organic **nonlinear optical** material containing DNA matrix and its manufacture
AB The material is obtained by inserting an org. color mol. having **nonlinear optical** property to DNA or a DNA-**lipid** compd. and optionally forming into a film. The material is manufd. by (1) adding a **lipid** to an aq. soln. of DNA for pptg. a water-insol. DNA-**lipid** compd., (2) dissolving the compd. into an org. solvent, (3) casting the soln. for forming a transparent film, and (4) immersing the film to a soln. of the org. color mol. In the manufg. steps, the org. color mol. may be dissolved in the soln. obtained in the second step and then cast. The material has **second harmonic** generation (SHG) property without orientation of elec. field. The material shows improved stability as third harmonic generation (THG) device.
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
IN Ogata, Naoya; Okahata, Yoshio; Rikugawa, Masahiro

L16 ANSWER 4 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 3
TI Nonlinear optics of chiral surface systems
AB The 2nd-order **nonlinear optical** technique,

2nd-harmonic generation (S , has characteristics desirabl n studying biol. surfaces: it has extreme surface specificity and submonolayer sensitivity; it is useful for studying buried aq. interfaces; and it is sensitive to chirality. The property of chirality can serve as an important marker for conformations of proteins, for example. To better understand SHG from chiral surfaces, we have performed in-depth studies on model monolayer systems in which the chirality can be controlled. Differential SHG signals from chiral surfaces are recorded using right and left circularly polarized incident light. We show that chiral information from the surface is conveyed through this SHG process. This study focuses on the model protein system, cytochrome c, adsorbed on various self-assembled mono- and bilayers at the solid/liq. interface. SHG-CD signals are shown to be related to the oxidn. state of the protein and are utilized to observe changes in this feature of the protein in situ at surfaces of varying chem. properties.

SO Appl. Phys. B: Lasers Opt. (1999), B68(3), 589-593
CODEN: APBOEM; ISSN: 0946-2171

AU Hicks, J. M.; Petralli-Mallow, T.

L16 ANSWER 5 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 4

TI A novel amphiphilic ferrocene derivative containing a barbituric acid unit: synthesis and quadratic optical non-linearity

AB A novel amphiphilic ferrocene deriv. (P) contg. barbituric acid was designed and synthesized. It has a .pi.-donor-switch-acceptor structure, in which the N,N-dioctadecylaniline unit serves as the electron donor, the ferrocene moiety as the switch, and the barbituric acid unit as the electron acceptor. The non-linear optical expts. show the **lipid** P displays efficient optical **second harmonic** generation (SHG) with a mol. hyperpolarizability (.beta.) as high as 1.8.times.10-28 e.s.u. The **lipid** P alone is unable to form a high quality monolayer at the gas-water interface. The mol. recognition of the **lipid** P and its complementary substrate-melamine deriv. (M), at the gas-water interface, may significantly improve the monolayer formation of the **lipid** P. The improvement of the monolayer has been found to exhibit a temp.-dependent effect: at about 24.5 .degree.C it reaches the optimum.

SO Thin Solid Films (1996), 284-285, 859-862
CODEN: THSFAP; ISSN: 0040-6090

AU Cao, Y.-W.; Chai, X.-D.; Yang, W.-S.; Lu, R.; Jiang, Y.-S.; Li, T.-J.; Blanchard-Desce, M.; Lehn, J.-M.

L16 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 5

TI Investigation of interfacial peptide-**lipid** interactions by optical **second harmonic** generation from tryptophan

AB The adsorption of pentapeptides to **lipid** monolayers spread at the air-water interface is investigated by optical **second harmonic** generation (SHG) in the reflection geometry. The **nonlinear optical** response of the tryptophan side chain present in each of the synthetic peptide sequences chosen was insufficient to allow detn. of its mol. orientation within the surface layer at the surface densities obtained by adsorption from the subphase. A difference in the character of peptide adsorption to **lipid** monolayers of various compns. was obsd. which depends on the nature of the monolayer interface accessible to the peptides. Results from crude and purified synthetic peptides are compared to point out the impact of potential hydrophobic impurities on the surface properties of the monolayer and on the measured **second harmonic** signal intensity. SHG studies of peptides and proteins adsorbed to membrane-mimetic **lipid** and phospholipid monolayers may suggest differences in the chem. nature of the monolayers which impact the ability of peptides and proteins to penetrate and interact with the membrane surface.

SO Proc. SPIE-Int. Soc. Opt. Eng. (1995), 2547(Laser Techniques for Surface Science II), 371-8
CODEN: PSISDG; ISSN: 0277-786X

AU Smiley, Beth L.; Vogel, Viola

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L16 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2002 ACS
AN 2002:49571 CAPLUS
TI Molecular probes for **nonlinear optical** imaging of biological membranes
AU Blanchard-Desce, Mireille H.; Ventelon, Lionel; Charier, Sandrine; Moreaux, Laurent; Mertz, Jerome
CS Institut de Chimie, Universite de Rennes I, Rennes, Fr.
SO Proceedings of SPIE-The International Society for Optical Engineering (2001), 4461(Linear and Nonlinear Optics of Organic Materials), 20-32
CODEN: PSISDG; ISSN: 02

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   FILE 'CAPLUS, MEDLINE, BIOSI   CA' ENTERED AT 08:28:34 ON 29     2002
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L5             2 S L3 AND L4
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L13            0 S L 6 AND L11
L14       958407 S LIPID#
L15           11 S L4 AND L14
L16            6 DUPLICATE REMOVE L15 (5 DUPLICATES REMOVED)

     FILE 'STNGUIDE' ENTERED AT 08:41:20 ON 29 JAN 2002
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L18          166 S LABEL# OR MARKER#
L19            0 S L4 AND L18
L20            2 S PROBE#
L21            0 S L4 AND L20
L22            0 S PROBE
L23            2 S PROBES
L24            0 S SURFACE (W) SELECTIVE (W) TECHNIQUE
L25            0 S SECOND (W) HARMONIC

     FILE 'CAPLUS, MEDLINE, BIOSIS, CA' ENTERED AT 08:47:23 ON 29 JAN 2002
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L28       704646 S PROBE#
L29          361 S L4 AND L28

=> s label# or marker#
L30       842799 LABEL# OR MARKER#

=> s l4 and l30
L31           14 L4 AND L30

=> s l31 1-14 ti abs so au
MISSING OPERATOR L31 1-14
The search profile that was entered contains terms or
nested terms that are not separated by a logical operator.

=> duplicate
ENTER REMOVE, IDENTIFY, ONLY, OR (?):remove
ENTER L# LIST OR (END):l31
DUPLICATE PREFERENCE IS 'CAPLUS, MEDLINE, BIOSIS, CA'
KEEP DUPLICATES FROM MORE THAN ONE FILE?  Y/(N):n
PROCESSING COMPLETED FOR L31
L32            6 DUPLICATE REMOVE L31 (8 DUPLICATES REMOVED)

=> d l32 1-6 ti abs so au

L32  ANSWER 1 OF 6  CAPLUS  COPYRIGHT 2002 ACS         DUPLICATE 1
TI   Second-harmonic imaging microscopy of living cells
AB   Second harmonic generation (SHG) has been developed in
     our labs. as a high-resoln. nonlinear optical imaging
     microscopy for cellular membranes and intact tissues.  SHG shares many of
     the advantageous features for microscopy of another more established
     nonlinear optical technique: two-photon excited
     fluorescence (TPEF).  Both are capable of optical sectioning to produce
     three-dimensional images of thick specimens and both result in less
     photodamage to living tissue than confocal microscopy.  SHG is
     complementary to TPEF in that it uses a different contrast mechanism and
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is most easily detected in e transmitted light optical pa[redacted]. It can be used to image membrane probes with high membrane specificity and displays extraordinary sensitivity in reporting membrane potential; it also has the ability to image highly ordered structural proteins without any exogenous **labels**.

SO J. Biomed. Opt. (2001), 6(3), 277-286
CODEN: JBOPFO; ISSN: 1083-3668

AU Campagnola, Paul J.; Clark, Heather A.; Mohler, William A.; Lewis, Aaron; Loew, Leslie M.

L32 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 2

TI **Nonlinear optical** measurement of membrane potential around single molecules at selected cellular sites

AB Membrane potential around single mols. has been measured by using the **nonlinear optical** phenomenon of **second harmonic** generation. This advance results from the interaction between a highly dipolar mol. with a selectively directed highly polarizable 1-nm gold particle. With this approach, a **second harmonic** signal, which is enhanced by the nanoparticle, is detected from a vol. of nanometric dimensions. This present work clearly shows that functional cellular imaging around single mols. is possible by selectively directing an antibody with a 1-nm gold **label** to a specific membrane protein. The results of this work open the way for three-dimensional, high resoln. functional imaging of membrane electrophysiol. in cells and cellular networks.

SO Proc. Natl. Acad. Sci. U. S. A. (1999), 96(12), 6700-6704
CODEN: PNASA6; ISSN: 0027-8424

AU Peleg, Gadi; Lewis, Aaron; Linial, Michal; Loew, Leslie M.

L32 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 3

TI Nonlinear optics of chiral surface systems

AB The 2nd-order **nonlinear optical** technique, 2nd-harmonic generation (SHG), has characteristics desirable in studying biol. surfaces: it has extreme surface specificity and submonolayer sensitivity; it is useful for studying buried aq. interfaces; and it is sensitive to chirality. The property of chirality can serve as an important **marker** for conformations of proteins, for example. To better understand SHG from chiral surfaces, we have performed in-depth studies on model monolayer systems in which the chirality can be controlled. Differential SHG signals from chiral surfaces are recorded using right and left circularly polarized incident light. We show that chiral information from the surface is conveyed through this SHG process. This study focuses on the model protein system, cytochrome c, adsorbed on various self-assembled mono- and bilayers at the solid/liq. interface. SHG-CD signals are shown to be related to the oxidn. state of the protein and are utilized to observe changes in this feature of the protein in situ at surfaces of varying chem. properties.

SO Appl. Phys. B: Lasers Opt. (1999), B68(3), 589-593
CODEN: APBOEM; ISSN: 0946-2171

AU Hicks, J. M.; Petralli-Mallow, T.

L32 ANSWER 4 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 4

TI **Second harmonic** generation in BaTiO3 film crystallized on tellurite glass surface

AB Tellurite glass of compn. 15TiO2.70TeO2 was prepd. from BaCO3, TiO2 and TeO2 as starting materials. Glass samples were annealed near the glass transition temp., cooled, and heat-treated at higher temp. for crystn. of BaTiO3. **Second harmonic** generation was measured by the **Marker** fringe method. The mechanism of **second harmonic** generation is discussed.

SO J. Mater. Sci. Lett. (1998), 17(13), 1063-1065
CODEN: JMSLD5; ISSN: 0261-8028

AU Tanaka, K.; Kuroda, H.; Narazaki, A.; Hirao, K.; Soga, N.

L32 ANSWER 5 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 5

TI **Nonlinear optical** properties of LiNbO3/Al2O3 films epitaxially grown by pulsed laser deposition

AB Numerous epitaxial LiNbO3 ms, i.e., LiNbO3(0001)/Al2O3(0[redacted]1), LiNbO3(0001)/ Al2O3(1120), and LiNbO3(1120)/Al2O3(1120) films, were grown by pulsed laser deposition. Low deposition temps. below 450.degree. were used to reduce a Li-deficient phase, LiNb3O8. Structural properties of the films, including twin formation, were investigated by x-ray .theta.-2.theta. scan and pole figure techniques. **Nonlinear optical** properties of these films were investigated using the **Marker** fringe and the Senarmont methods. The **nonlinear optical** coeffs. related to the SHG, i.e., d31 and d33, were measured and their values were found to be very close to the LiNbO3 single crystal values. It was also found that the SHG .phi.-scan can provide information on twin formations and in-plane orientation of the film. Electrooptical (EO) properties of the films were also studied. Films with different orientations display large differences in their EO properties: the epitaxial LiNbO3(0001) films show little EO effects, but the LiNbO3(1120) film shows a large quadratic EO behavior with an effective coeff. of 2.38 .times. 10-15 m2/V2.

SO Integr. Ferroelectr. (1998), 20(1-4), 25-37
CODEN: IFEREU; ISSN: 1058-4587

AU Lee, See-Hyung; Noh, T. W.

L32 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 6

TI Optical **second-harmonic** generations of liquid crystalline main-chain polymers

AB Optical **second-harmonic** generation (SHG) of liq. cryst. main-chain copolymers of 2-hydroxy-6-naphthoic acid (HNA) with 4-hydroxybenzoic acid (PHR) was studied. Copolyesters with various compn.-ratio were prepd. The SHG activity of each sample was evaluated by both the powder and **Marker** fringe methods. Double orientation processing was effective to obtain the sample of high SHG activity. The effective **nonlinear optical** coeff. d(eff) of the sample with the compn. PHR/HNA (60/40), which was prepd. to be a plane-plane oriented (double orientation) film of thickness 10-30 .mu.m, was 10 times that of quartz d11 value (0.50 pm/V). The application of the copolyesters to SHG devices is possible.

SO Mol. Cryst. Liq. Cryst. Sci. Technol., Sect. A (1994), 254, 125-35
CODEN: MCLCE9; ISSN: 1058-725X

AU Asada, Tadahiro

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L4 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 5

TI "SHG-**labels**" for detection of molecules by **second harmonic** generation

AB The concept and technique of "SHG-labels" are introduced. SHG-**labels** are **second harmonic**-active moieties which can be attached to some mol. or particle of interest that is not SH-active, in order to render the mol. amenable to study at an interface. The labeled mols. may then be studied by surface-selective techniques such as second harmonic generation (SHG) or sum-frequency generation. In the first example of the technique, a protein, cytochrome c, was labeled with sulfhydryl- or amine-specific SH-active dyes. SHG-labels should find use in studying a variety of interfacial reactions.

SO Chemical Physics Letters (2001), 342(5,6), 485-491
CODEN: CHPLBC; ISSN: 0009-2614

AU Salafsky, J. S.

L4 ANSWER 17 OF 29 SCISEARCH COPYRIGHT 2002 ISI (R)

TI Energetics and population of molecules at microscopic liquid and solid surfaces

AB A new application of **second harmonic** generation to selectively probe the surface of microscopic size centrosymmetric structures in centrosymmetric bulk media has been applied to polymer beads in aqueous solution and to oil droplets in an oil/water emulsion. The free energies of adsorption and the surface densities of organic molecules adsorbed from aqueous solution to 1 mu m polystyrene bead surfaces and to 230 nm tetradecane oil droplet surfaces have been determined. The potential use of this method as a chemical and biochemical sensor without the need for a fluorescent or magnetic **tag** is noted.

SO JOURNAL OF PHYSICAL CHEMISTRY B, (4 JUN 1998) Vol. 102, No. 23, pp. 4446-4450.
Publisher: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036.
ISSN: 1089-5647.

AU Wang H F; Yan E C Y; Liu Y; Eisenthal K B (Reprint)